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EXAMINER

AGUIRRECHEA, JAYDI A

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2834

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Please find below and/or attached an Office communication concerning this application or proceeding.



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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 09/670,261
Filing Date: September 26, 2000
Appellant(s): CHEW, DAVID W.

David M. Sigmond
For Appellant

EXAMINER'S ANSWER

MAILED
SEP 10 2004
GROUP 2800

This is in response to the appeal brief filed May 12, 2004.

(1) *Real Party in Interest*

A statement identifying the real party in interest is contained in the brief.

(2) *Related Appeals and Interferences*

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) *Status of Claims*

The statement of the status of the claims contained in the brief is correct.

(4) *Status of Amendments After Final*

No amendment after final has been filed.

(5) *Summary of Invention*

The summary of invention contained in the brief is correct.

(6) *Issues*

The appellant's statement of the issues in the brief is correct.

(7) *Grouping of Claims*

Appellant's brief includes a statement that claims 6, 7, 9, 10, 16, 17, 19, 20 and 51-70 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) *Claims Appealed*

The copy of the appealed claims contained in the Appendix to the brief is correct.

Art Unit: 2834

(9) Prior Art of Record

5973421	IWABUCHI	10-1999
6040650	RAO	03-2000

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

This rejection is set forth in a prior Office Action, mailed on 5/7/2004.

- Claims 6, 7, 9, 10, 16, 17, 19, 20, 51-62 and 64-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,982,069/6,040,650 (which is a continuation in part of 5,982,069) to Rao (hereinafter Rao) in view of US Patent 5973421 to Iwabuchi (hereinafter Iwabuchi).

Rao discloses a winding (30) having a varying cross sectional area along its length (Figure 3 and column 5, lines 31-32); the winding being made of conductive material defining a flat band with a generally triangular shape (Figure 3); having first, second and third curved portions; first and second active (31a, 31b) portions and an inactive portion (33).

However, Rao fails to disclose:

- the winding being rotatable; and
- the winding being used in a voice coil for a disk drive.

Iwabuchi discloses a voice coil motor actuator (VCM 16) for a magnetic disk drive comprising:

- a rotatable spiral winding (18) made of conductive material defining a flat band with a generally triangular shape with an open center (Figures 1A, 1B);

Art Unit: 2834

- first and second active leg portions (which generate a magnetic flux to act on the magnet upon energization, thereby applying a pivot force to the positioner) and an inactive leg portion (column 1, lines 60-65)

It would have been obvious at the time of the invention was made to use the structure of the winding as disclosed by Rao in a voice coil for a disk drive having rotatable spiral winding as disclosed by Iwabuchi, since it is known in the art the voice coils have advantages, such as: easier assembly; reduced cost of manufacture and it provides a compact structure.

With regards to claim 7, Rao discloses that the cross-sectional area of each of the segments that define the inactive leg portion is smaller than the cross-sectional area of each of the remaining segments that define the first and second active leg portions (Figure 3 of the '069 patent).

With regards to claim 9, Rao discloses that the radius of curvature of the first curved corner portion is greater than the radius of curvature of the second and third curved corner portions.

With regards to claim 10, Rao discloses that the radius of curvature of the second curved corner portion is equal to the radius of curvature of the third curved corner portion.

With regards to claim 16, the combination of Iwabuchi and Rao teaches the claimed limitations including the actuator member (16) in a disk drive.

With regards to claim 17, Rao discloses that the cross-sectional area of the segments that define the inactive leg portion is smaller than the cross-sectional area of the remaining segments.

Art Unit: 2834

With regards to claim 19, Rao discloses that the radius of curvature of the first curved corner portion is greater than the radius of curvature of the second and third curved corner portions.

With regards to claim 20, Rao discloses that the radius of curvature of the second curved corner portion is equal to the radius of curvature of the third curved corner portion

With regards to claim 51, the combination of Iwabuchi and Rao discloses the claimed structure including the voice coil for driving an actuator arm to various positions over a disk of a disk drive and the structure of the voice coil.

With regards to claim 52, Rao discloses that the spiral winding is a planar coil (see figure 3 of the '650 document).

With regards to claim 53, Rao discloses that the spiral winding, is a single-layer coil.

With regards to claim 54, Rao discloses that the spiral winding is a planar single-layer coil.

Referring to claim 55, Rao discloses that the spacing between each loop of the spiral winding remains substantially the same throughout the spiral winding (see figure 4 of the '069 reference).

Referring to claim 56, Rao discloses that the height of the spiral winding remains substantially the same throughout the spiral winding (figure 6 of the '650 document).

Referring to claim 57, Rao discloses that the spacing between each loop of the spiral winding remains substantially the same throughout the spiral winding, and the height of the spiral winding remains substantially the same throughout the spiral winding.

Art Unit: 2834

With regards to claim 58, Rao discloses that a width of the segments defining the inactive leg portion is substantially smaller than a width of the segments defining the first and second active leg portions.

With regards to claim 59, Rao discloses that a width of the segments defining the first active leg portion is the same as a width of the segments defining the second active leg portion 1.

Referring to claim 60, Rao discloses that the cross-sectional area of the segments defining the inactive leg portion is substantially smaller than the cross-sectional area of the segments defining the first and second active leg portions.

With regards to claim 61, Rao discloses that the cross-sectional area of the segments defining the first active leg portion is the same as the cross-sectional area of the segments defining the second active leg portion.

With regards to claim 62, Rao discloses a top insulating layer and a bottom insulating layer, wherein the spiral winding is sandwiched between the top and bottom insulating layers.

With regards to claim 64, Rao discloses that the top insulating layer is secured to the spiral winding by an adhesive (epoxy).

With regards to claim 65, Rao discloses that the bottom-insulating layer is secured to the spiral winding by an adhesive.

With regards to claim 66, Rao discloses that the top and bottom insulating layers are secured to the spiral winding by adhesives.

With regards to claim 67, the combination of Iwabuchi and Rao discloses the claimed invention including the limitation of the winding adapted to interact with the magnetic field of a permanent magnet (7) and the structure of the winding.

With regards to claim 68, Rao discloses that the spacing between each loop of the spiral winding remains substantially the same throughout the spiral winding, and the height of the spiral winding remains substantially the same throughout the spiral winding.

With regards to claim 69, Rao discloses that the cross-sectional area of the segments defining the inactive leg portion is substantially smaller than the cross-sectional area of the segments defining the first and second active leg portions, and a cross-sectional area of the segments defining the first active leg portion is the same as a cross-sectional area of the segments defining the second active leg portion.

With regards to claim 70, Rao discloses a top insulating layer and a bottom insulating layer, wherein the spiral winding is sandwiched between the top and bottom insulating layers and secured to the top and bottom insulating layers by adhesives.

- Claim 63 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rao in view of Iwabuchi as applied to claim 62 above, and further in view of US Pat. 4,728,390 to Yamamoto (hereinafter Yamamoto).

Iwabuchi and Rao substantially teach the claimed invention except that they do not show that the first and second layers are polyimide.

Yamamoto discloses that the first and second layers are polyimide for the purpose of insulating the layers of conductive material (column 3, lines 3-14). The polyimide is known in the art as an insulator having advantages such as that its thickness can be easily controlled, it is thin and light in weight and provides excellent mechanical and heat resistant properties.

Therefore, It would have been obvious at the time of the invention was made to use polyimide as insulating layers because of its known advantageous properties.

Art Unit: 2834

(11) Response to Argument

- Applicant's Argument: Rao says nothing about the stator being a voice coil in a disk drive.
- Applicant's Argument: Rao fails to teach or suggest a voice coil for a disk drive. Although Rao discloses that a motor with winding lamination 50 can be used in a disk drive (col. 3, lines 61-65), Rao says nothing about the motor being a voice coil motor. Disk drives also contain spindle motors for rotating the disks.
- Applicant's Argument: Rao also fails to teach or suggest that winding lamination 50 is rotatable. Instead, Rao discloses that winding lamination 50 is a stator for a three-phase motor.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

The Examiner notes Rao was relied upon for the teachings of a coil winding (30) having a varying cross sectional area along its length (Figure 3 and column 5, lines 31-32); the winding being made of conductive material defining a flat band with a generally triangular shape (Figure 3); having first, second and third curved portions; first and second active (31a, 31b) portions and an inactive portion (33). As stated in the Office Action, Iwabuchi was relied upon for the teachings of a voice coil in a disk drive. Further, Rao's invention produces a higher torque capacity in the electric machine, and thus, one of ordinary skill would entertain the idea of using the coil winding 30 (in Rao) in the voice coil motor of Iwabuchi. Accordingly, the *combination* Rao-Iwabuchi discloses the claimed invention.

The coil winding disclosed in Rao's is to be used in an electric motor. It is known in the art that the coils could be placed either in the stationary part or in the movable part of the electric motor.

Art Unit: 2834

- *Applicant's Argument: Rao also fails to teach or suggest that winding lamination 50 has a generally triangular shape. Instead, Rao discloses that winding lamination 50 has a generally circular shape.*

As stated in the rejection, in figure 3, the outer shape of the coil 30 in Rao's (Figure 3) shows a generally triangular shape. Moreover, the Examiner recited the coil winding having a triangular shape as element 30 Rao's, not as element 50.

- *Applicant's Argument: Rao also fails to teach or suggest that phase coil 30 has an open center. Instead, Rao discloses that phase coil 30 has a covered center, covered by another phase coil in winding lamination 50.*

However, in figure 3, Rao discloses the coil 30 having an open or void central area (Col. 6, line 35).

- *Applicant's Argument: Iwabuchi fails to teach or suggest that coil 18 includes a band with cross-sectional area that varies along its length.*

Iwabuchi was not relied upon for this feature. Rather, Rao discloses the conductor having a cross-sectional area that varies along its length (Column 5, lines 31-32). The Examiner notes that Applicant is considering the references by themselves, not as a combination. See *In re Keller, Supra*.

- *Applicant's Argument: There is no teaching, suggestion or motivation to modify coil 18 in Iwabuchi to provide winding lamination 50 in Rao.*

The Examiner is not proposing to modify the coil 18 in Iwabuchi to provide the lamination 50 in Rao. The Examiner proposes that one with ordinary skill in the art would modify the coil 18 in Iwabuchi to use the coil winding 30 in Rao. The motivation: to produce a higher torque capacity in the electric machine (Rao, Col. 4, line 28-29).

- *Applicant's Argument: Rao is non-analogous to the present invention.*

In response to applicant's argument that Rao is nonanalogous art, it has been held that a

Art Unit: 2834

prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Rao discloses a coil winding to be used in *any* electric motor; said coil winding having a particular shape and characteristics suitable for producing a higher torque capacity. This advantage will lead to a machine having higher efficiency.

- *Applicant's Argument: The proposed modification is vague and confusing.*

As stated in the Rejection, page 2, item 3, the coil 18 in Iwabuchi is replaced by coil 30 in Rao. The motivation is clearly set forth in Rao, i.e. to produce a higher torque capacity in the electric machine (Column 4, lines 28-29).

- *Applicant's Argument: Rao fails to teach or suggest that winding lamination 50 pertains to a voice coil for a disk drive.*

The shape of the coil 30 disclosed in Rao could be used in any electric motor. The examiner proposes to use the coil 30 in Rao having a generally triangular shape comprising two active legs, an inactive leg, three curved portions connecting the two active legs and the inactive leg, wherein the cross sectional area of the band varies along its length in the voice coil for a disk drive disclosed by Iwabuchi. The Examiner notes that Applicant is considering the references by themselves, not as a combination. See *In re Keller*, Supra.

- *Applicant's Argument: Rao fails to teach or suggest providing phase coils 30 on only a single side of central axis 7. Thus, winding lamination 50 is not suitable as a voice coil for a disk drive. Rao also fails to teach or suggest using a single-phase coil 30 as the stator, particularly since this would contradict the stated objective of reducing open area within the coil.*

Art Unit: 2834

In response to applicant's argument that the lamination 50 is not suitable as a voice coil for a disk drive, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Further, the Examiner is not proposing to incorporate the lamination 50 in the voice coil, instead, the characteristics of the coil 30 in Rao be used in Iwabuchi's voice coil motor.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., phase coils on only one side of the central axis) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). It is immaterial to address limitations that are not recited in the claims.

- *Applicant's Argument: The Examiner's attempt to establish motivation for the proposed modification amounts to hindsight reconstruction using the present invention as a blueprint.*

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392,

Art Unit: 2834

170 USPQ 209 (CCPA 1971). It is *not* hindsight if the motivation comes directly from the references. In the instant case, Rao produces a higher torque capacity in the electric machine (Column 4, lines 28-29).

- *Applicant's Argument: Claim 7 recites "the cross-sectional area of each of the segments that define the inactive leg portion is smaller than the cross-sectional area of each of the remaining segments that define the first and second active leg portions." Claims 17 and 51 recite similar limitations. Rao fails to teach or suggest this approach.*

Rao discloses the wires used to form the phase coil 30 have an increasing width as they progress in the radial direction (Figure 3 shows this feature), while the inactive area can be uniform width. Rao also discloses that the width could be maintained constant (Column 5, lines 43-46). It is the Examiner's position that the conductors in the inactive area have a smaller cross sectional area than that of the active portions close to the outer radius.

- *Applicant's Argument: Claim 9 recites "the radius of curvature of the first curved corner portion is greater than the radius of curvature of the second and third curved corner portions." Claim 19 recites similar limitations.*

The Examiner notes Iwabuchi was not relied upon for the teachings of a voice coil in a disk drive, rather Rao. It is shown in Rao's figure 3, that the radius of curvature of the first curved corner is greater than the radius of curvature of the second and third curves since the active legs are longer than the inactive leg.

- *Applicant's Argument: Claim 52 recites "the spiral winding is a planar coil."*

As stated in the rejection, Rao discloses the spiral winding being a planar coil.

- *Applicant's Argument: Claim 53 recites "the spiral winding is a single-layer coil."*

As stated in the rejection, Rao discloses the winding as a single layer coil.

- *Applicant's Argument: To establish a prima facie case of obviousness (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine*

Art Unit: 2834

reference teachings; (2) there must be a reasonable expectation of success, and (3) the prior art reference (or references when combined) must teach or suggest all the claim limitations (MPEP § 2143). See also C.R. Bard, Inc. v. M3 Systems, Inc., 157 F.3d 1340, 1351 (Fed. Cir. 1998).

In response to applicant's argument, the Examiner states:

1. Motivation: to produce a higher torque capacity in the electric machine.
2. Reasonable expectation of success: the electric machine will perform more efficiently.
3. Prior art references teach or suggest all the limitations: Rao and Iwabuchi disclose all the claim limitations as explained above.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Jaydi A. Aguirrechea
September 2, 2004

Conferees
Darren Schuberg
Brian Sircus

A handwritten signature in black ink, appearing to read "David M. Sigmond", written over a horizontal line.

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